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| Subject code & Name | : | **CE144 – Object oriented programming with C++** | Practical | : | **5** | Academic Year | : | **2022-2023** |
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| ***Practical Set - 5*** |
| **Aim 5.1:** Write a C program defining Structure Rectangle with data member’s width and height. It has get values() member functions to get the data from user and area() member functions to print the area of the rectangle.  Also create a C++ Class for the above program. Define the data members and both functions inside the class. Get the area of the rectangle as an output.  **Expected Output:**  Fill the following table to showcase your outcome, also attach the screenshot of output**.**  **Result using C Structure**   |  |  |  | | --- | --- | --- | | **Inputs** | | **Output** | | **Height** | **Width** | **Area of Rectangle** | | 4 | 5 | 20.000000 |   Resulting using C++ class   |  |  |  | | --- | --- | --- | | **Inputs** | | **Output** | | **Height** | **Width** | **Area of Rectangle** | | 12 | 25 | 300 | |
| ***Code*** |
| C Structure:      C++ class: |
| ***Output*** |
|  |
| ***Question-Answers*** |
| **1. Illustrate the difference between C Structure and C++ Class.**   |  |  | | --- | --- | | **C Structure** | **C++ Class** | | Structures are value types | Class are reference types | | It uses stack allocation | It uses heap allocation | | Structure variables are public by default | Class variables are private by default | | Structures are not inheritable | Class is inheritable |   **Ans.** |
| **Aim 5.2:** Write a C++ program having class Batsman. It has private data members: batsman\_name, bcode (4 Digit Code Number), innings, not\_out, runs, batting average. Innings, not out and runs are in integer and batting\_average is in float.  Define following function outside the class using scope resolution  operator. 1) Public member function getdata() to read values of data members. 2) Public member function putdata() to display values of data members. 3) Private member function calcavg() which calculates the batting average of a batsman. Also make this outside function inline.  Hint: batting\_average = runs/(innings – not\_out)  **Expected Output:** Fill the following table to showcase your outcome, also attach the screenshot of output.   |  |  |  | | --- | --- | --- | | Parameters | Inputs | Outputs (Batting Average) | | Name | VIRAT\_KOHLI | 54 | | Bcode | 2512 | | Total innings | 79 | | Enter not\_out\_runs | 33 | | Enter total runs | 2500 | |
| ***Code*** |
|  |
| ***Output*** |
|  |
| **Aim 5.3:** Define class Currency having two integer data members rupee and paisa. A class has member functions enter() to get the data and show() to print the amount in 22.50 format. Define one member function sum() that adds two objects of the class and stores answer in the third object i.e. c3=c1.sum(c2). The second function should add two objects of type currency passed as arguments such that it supports c3.add(c1, c2); where c1, c2 and c3 are objects of class Currency. Also Validate your answer if paisa >100. Write a main( ) program to test all the functions.  **Use concepts of Object as Function Arguments, function returning object and function overloading.**  **Expected Output:**  Fill the following table to showcase your outcome, also attach the screenshot of output.   |  |  |  | | --- | --- | --- | | Using sum() | | | | Rupees | Paisa | Total amount | | 50 | 45 | 141 Rupees 95 Paisa | | 90 | 152 | |
| ***Code*** |
|  |
| ***Output*** |
|  |
| **Aim 5.4:** Define a class Dist with int feet and float inches. Define member function that displays distance in 1’-2.5” format. Also define member function scale ( ) function that takes object by reference and scale factor in float as an input argument. The function will scale the distance accordingly. For example, 20’-5.5” and Scale Factor is 0.5 then answer is 10’-2.75”**Expected Output:** Fill the following table to showcase your outcome as per inputs given, also attach the screenshot of output.   |  |  |  |  | | --- | --- | --- | --- | | Feet | Inches | Scaling Factor | Output | | 6 | 2 | 2 |  | | 3 | 5 | 0 |  | | 7 | 0 | 3 |  | |
| ***Code*** |
|  |
| ***Output*** |
|  |
| ***Question-Answers*** |
| **1. Differentiate between \n and endl in two points in below given tabular format:**  **Ans.**  **Sr No. \n endl**  **1.** It inserts a new line. It inserts a new line and flushes the stream (output buffer).  **2.** It is supported by both C and C++. It is only supported by C++. |
| **Aim 1.2: Write a program to create the following table by making use of endl and setw manipulator**  **https://lh6.googleusercontent.com/S3DVmuFSLpEN1tkSRpBhW6BQQ_rWR-UgN5onTKdoztcC7w4ElJukE9nwGv73IAZ04NjW_NfBsdSrtdaXVojaNkGpxbIgHUuRL6jLAg_m48IRXU11wrVeqkBVU_rRL1Wm07AB5qHd_Py1t05P8Lzs8w** |
| ***Code*** |
|  |
| ***Output*** |
| **https://lh6.googleusercontent.com/YF5SRDBK1uzvImSb0tGKwhaNCjPnElsLoKhxG5wcUx_DEiS6OgGXDx3H2mGDT6NKCuuRCdthoxcjKTV64FEbBra4aFSQt605N6IswkyT-9vkPoAnWf4U7ZoaigLNL8t81sVkz9tfcDAOX1_2-wQiIQ** |
| ***Question-Answers*** |
| 1. **Explain any three manipulators in the below given tabular format.**   **Ans.**  **1.** endl: It is used to insert a new line and after entering a new line it flushes the output stream.  **2.** ws: It is used to ignore the whitespaces in the string sequence.  **3.** ends It inserts a null character into the output stream. |
| **Faculty Signature : Grade:** |